

*The migration to SOLA for  
derivatives traded on  
Oslo Børs*

2 September 2009

# *Agenda*

- Introduction
- Open interest and parallel period
- SOLA technical specifications
- Connectivity options
- Customer testing overview
- Status front end
- Product offering and member rules
- Q&A session

# *Open interest and parallel period*

*Jesper von Zweigbergk, SVP Derivatives Oslo Børs*

2 September 2009

## *Open interest and parallel period*

- Open interest in foreign instruments carried forward
- All products launched on SOLA 16 November 2009
- CLICK overlap until 18 December 2009

# *SOLA technical specifications*

*Ernst Rolf von Düring, Test Coordinator Oslo Børs*

2 September 2009

# *Introduction*

- Protocols
  - SAIL
  - FIX
  - HSVF – Broadcast real-time trading and statistical information
- Technical specifications issued on 23<sup>rd</sup> June
- 5 documents
  - HSVF Specification
  - SAIL Specification
  - SAIL Business Design Guide
  - FIX Specification
  - FIX Business Design Guide

# High Speed Vendor Feed - HSVF

- HSVF uses a TCP/IP broadcast interface
  - No wait for acknowledgement before sending next message
  - Re-transmission available
- Each message type is fixed in format
- HSVF messages consist of a standard message header followed by the message body which varies in format according to the message type



## *HSVF - Message Types*

- Trade Messages
- Request for Quote Messages (RFQ)
- Quote Messages
- Market Depth Messages
- Trade Cancellation Messages
- Instrument Keys Messages
- Summary Messages
- Beginning of Summary Messages
- Other Messages

## *HSVF Re-transmission*

- The 'RS – Connection Message' allows a participant to request:
  - Re-transmission of all messages from start of day
  - Re-transmission from current message
  - Re-transmission from a specified sequence number

# *SAIL Business Design Guide*

- Should be used in conjunction with the SAIL specification
- Market model
- Trading phases
  - Consultation start
  - Order cancellation
  - Trading session (Continuous Trading)
  - Exchange intervention
  - Consultation end
  - Mini batch
  - Post-session
- SAIL Message Flow (Appendix)

# *SAIL Business Design Guide*

## *- Connection Types*

- All member firms are assigned a unique Participant ID
- Two types of entities are found under each Participant ID
  - **Connections:** entry points to the SOLA Front-end. A Participant can have several connections depending on requirements.
  - **Traders:** logical persons or groups of persons owning orders entered on the order book.

SAIL Message	OR	BQ	PQ
Order Entry (OE)	✓		
Order Modification (OM)	✓		
Order Cancellation (XE)	✓		
Request For Quote (RQ)	✓	✓	
Bulk Quotes (Qi, BD)		✓	
Global Cancellation (GC)		✓	✓

# *SAIL Business Design Guide*

## *- Order Management*

- Order Types:
  - Limit orders
  - Top orders
  - Market orders
  - STOP orders
- Quantity Terms
  - Minimum Quantity
  - Disclosed Quantity
- Order Duration
  - Day
  - GTD
  - GTC
  - Immediate orders (IOC)

# *SAIL Business Design Guide*

## *-Quote Management*

- Bulk quote data
  - specifies the clearing data for all trades that may occur as a result of their quotes
  - Acknowledgement contains a Quote ID
- Bulk quote message – Qi
  - Allows 1 to 280 separate quotes in one message
  - SOLA validates the whole message and each individual quote
- Global cancellation
- Market maker protection
  - Standard protection
  - Advanced protection

## *FIX Business Design Guide*

- Should be used in conjunction with the FIX Specification
- SOLA utilises FIX 4.2 with a few exceptions
- The FIX interface to SOLA does not provide functions related to Market Making

# *Connectivity options*

*Ernst Rolf von Düring, Test Coordinator Oslo Børs*

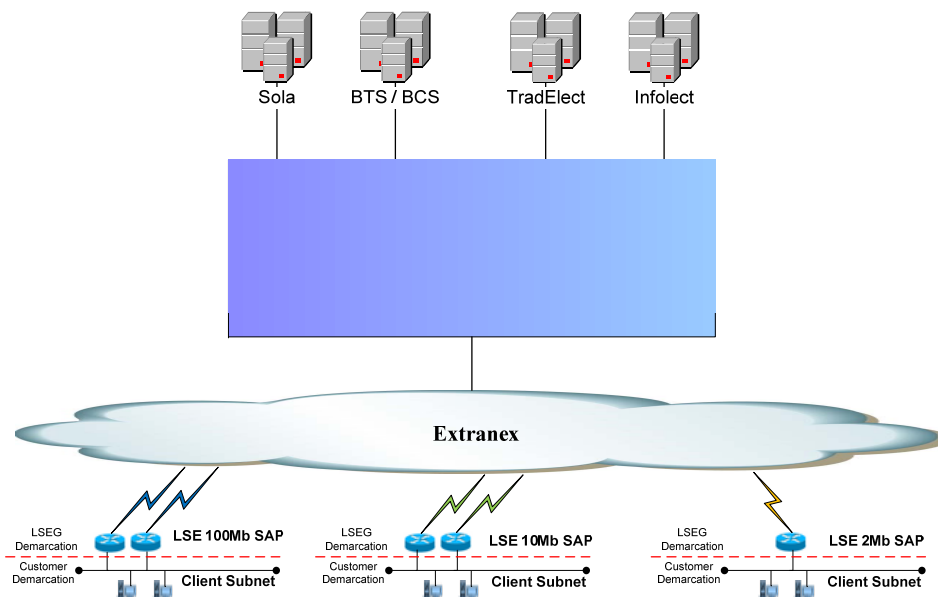
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# *Agenda*

- Current connection setup
  - Existing connections
  - Cancellation of existing connections
- New connection options
  - Extranex
  - VPN
  - NSP (FNN, VPNett, Verizon)
  - VAN

# Extranex

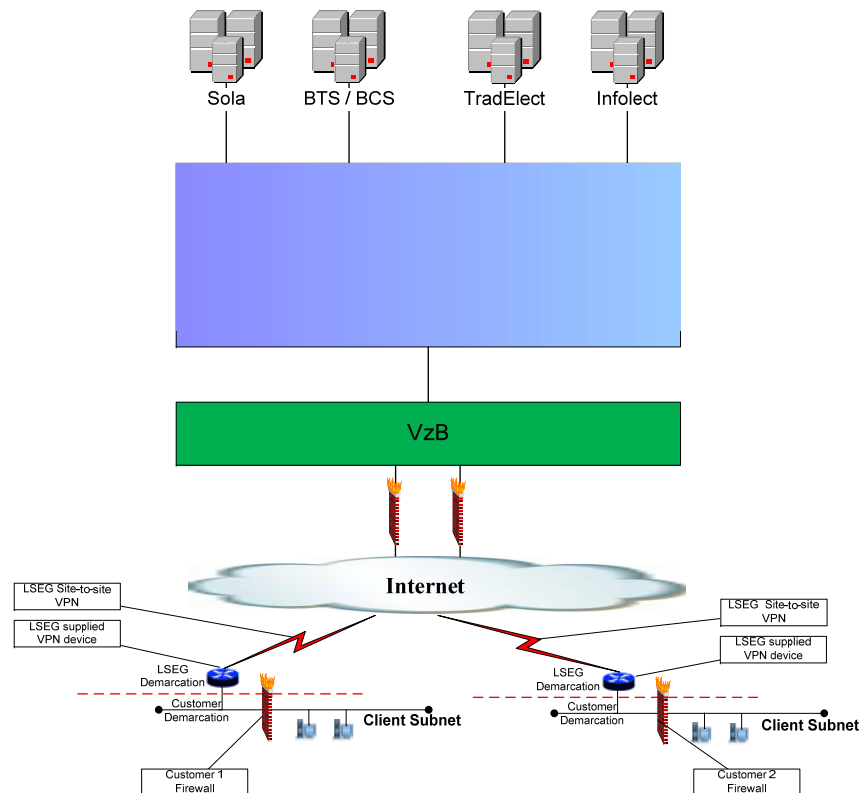
- The fully-managed private network used by the London Stock Exchange to provide access to trading and information systems
- Provides a secure, resilient communication service which is constantly monitored and managed by a dedicated Exchange resource
- A single Extranex connection allows members to access multiple Exchange services, e.g. SOLA, BTS, BCS, etc.



# Virtual Private Network (VPN)

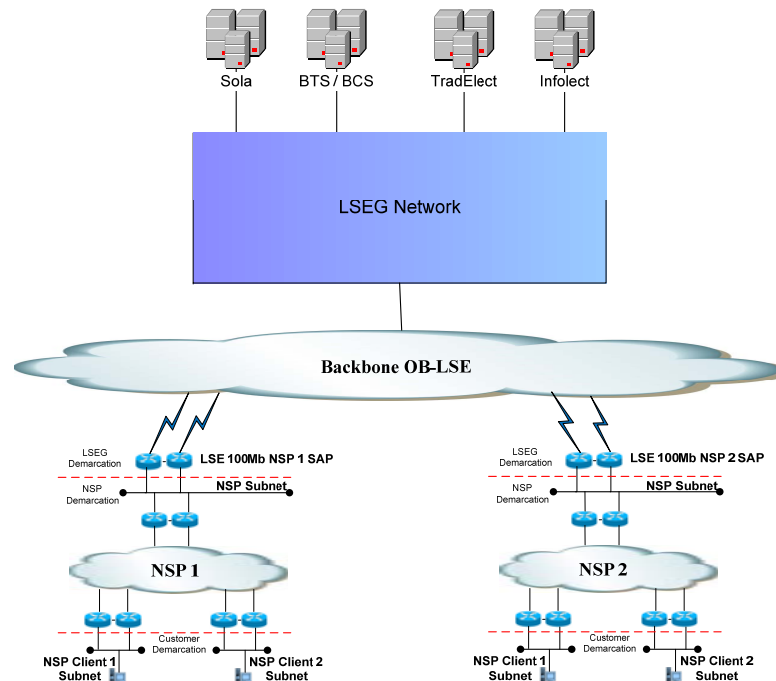
*A service to be provided by the Exchange for connectivity to simulation and production environments*

- The Exchange will provide a router to the customer, pre-configured to connect to the Exchange.*



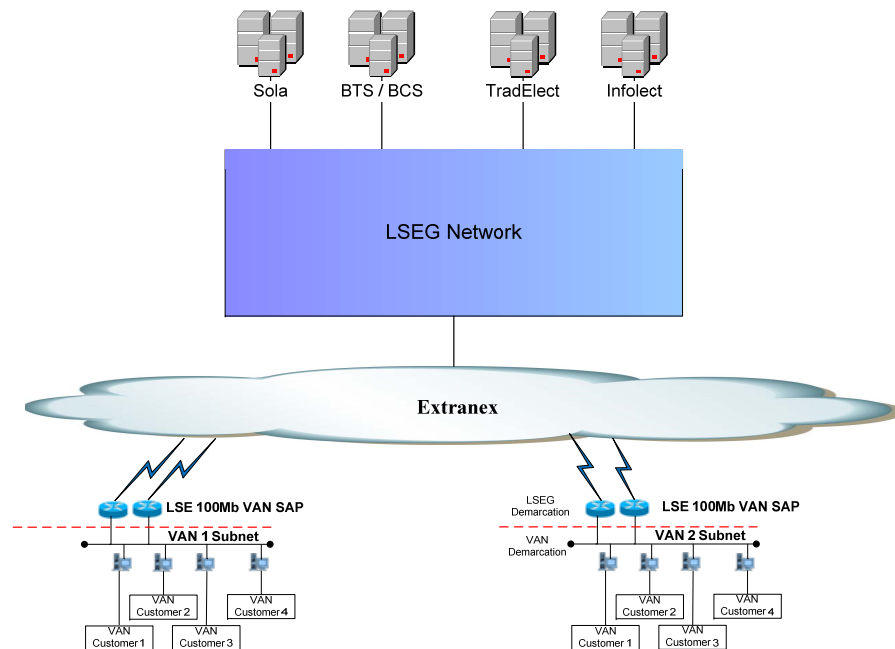
# Network Service Providers (NSP)

- Act as carriers of Exchange information and trading services
- Member firms contract with NSPs for provision of network connectivity but sign agreements directly with the Exchange for access to trading and information services
- Member firms using an NSP connection will have individual service enablements set up for trading and information systems
- The data and trading feeds are in the same format as those received by a directly connected member and are subject to the same testing requirements
- Member firms employing NSP connectivity will either deploy an accredited ISV solution or develop bespoke interfaces to our feeds.



# Vendor Access Network (VAN)

- Allows vendors to share LSE communications infrastructure across a number of trading members
- Allows a more cost effective and resilient solution to be provided, especially relevant for the smaller broker
- The Vendor Access solution is more flexible than the standard hosted solution in which members require a separate communications installation. Allows customers to utilise an accredited provider's network and applications for trading connectivity to the Exchange.



# *Customer testing overview*

*Ernst Rolf von Düring, Test Coordinator Oslo Børs*

2 September 2009

# *Introduction*

- CDS Market
- Periods
- IP Addresses
- CDS Access
- Development and Certification
- Timelines

# *Underlyings and instruments, CDS*

## Initial list of products

Swedish	Russian	Danish	Finnish	Norwegian
Index	Index	Index	Index	Index
ABB	OGZD	DANSKE	OUT1V	Mirror production
AZN	MNOD	MAERSK		
Ericsson	LKOD			
HMB	ROSN			
LUPE				

## *Market hours, CDS*

- All markets have the same periods
- Additional time in the morning to log in
- Extra hour in the evening after the existing markets close

	Norwegian Index	Norwegian Stock
Start of Consultation	06.30	06.30
Continuous Trading	09.00-18.20	09.00-18.20
Surveillance Intervention	18.20	18.20
End of Consultation	18.25	18.25
Mini Batch	19.00	19.00

Times are in CET

## *IP Addresses*

<b>Services – Oslo Bors</b>	<b>IP Address</b>	<b>TCP Port</b>
PROD OSLO SAIL	194.169.13.130	61301
PROD OSLO FIX	194.169.13.132	61351
PROD OSLO HSVF	194.169.13.146	62301
CDS OSLO SAIL	194.169.13.162	51301
CDS OSLO FIX	194.169.13.164	51351
CDS OSLO HSVF	194.169.13.166	52301

## *Customer IP Addresses*

- Oslo Børs customers may access **SOLA** addresses from the following host IP address ranges:
  - FNN: 146.72.244.0/24 and 146.72.245.0/24
  - VPNett: 195.204.120.0/24
  - Verizon: To be announced
- Clients will not be able to access SOLA Test or Production environments unless the appropriate Username and Passwords are granted.

## *Test and Production Access*

Participant/ISV to determine

- Access requirements
- Technical information
- Clearing information

Deliverables

- Test Environment Access Request Form
- Prod Environment Access Request Form

# *Development and Certification*

## Exchange support for Participants and ISVs

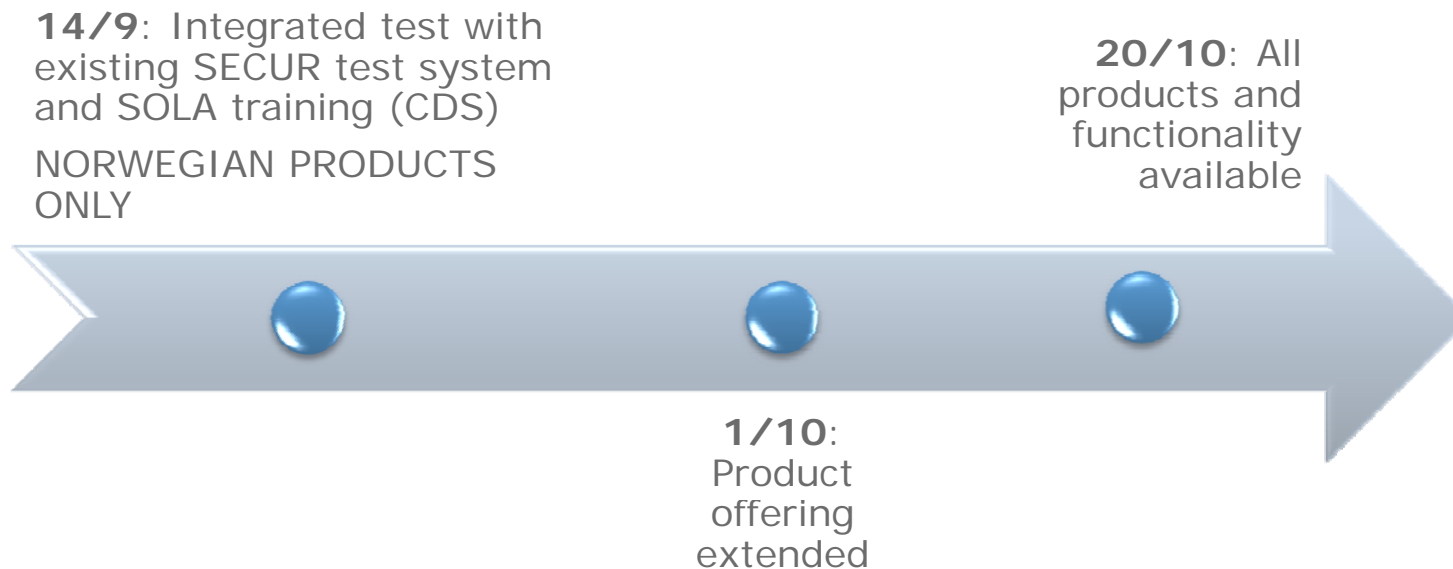
- Development support
- 1<sup>st</sup> line Support
- Test Scheduling
  
- Sail Certification
  - Sail Certification Request Form
  - Sail Certification Test Cases
- Fix Certification
  - Fix Certification Request Form
  - Fix Certification Test Cases
- HSVF Certification

# Timelines

Month	Key activities
August	CDS Enablement
September	Testing Documentation Conformance Tests Dress Rehearsal & Go-Live Guide
October	Dress Rehearsals on 17/10 and 31/10
November	Dress Rehearsal on 7/11. Go-live 16/11
	All key activity dates are indicative

## *Member integration test*

- The parallel test system is open between 09:00 - 14:00
- SECUR environment: EXTTST1 (SEOMMC), 192.176.3.151:5024
- The dress rehearsals in Oct and Nov will not include SECUR



# *Status front end*

*Preben Danielsen, Head of Brokerage Services Oslo Børs*

2 September 2009

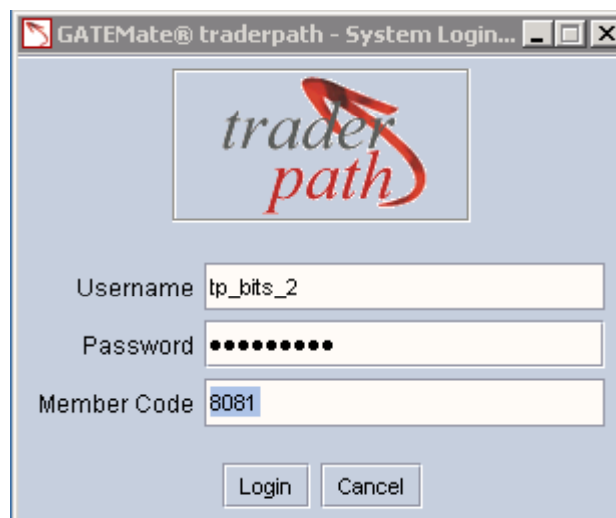
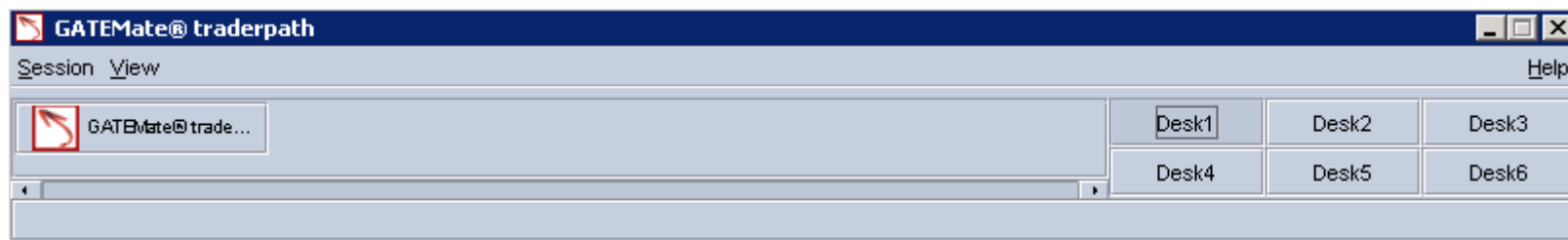
# *Summary*

- BTS connectivity
- BTS main window
  - Login
  - Market information
  - Trading Manager
  - Quoting
- When available
- Pricing

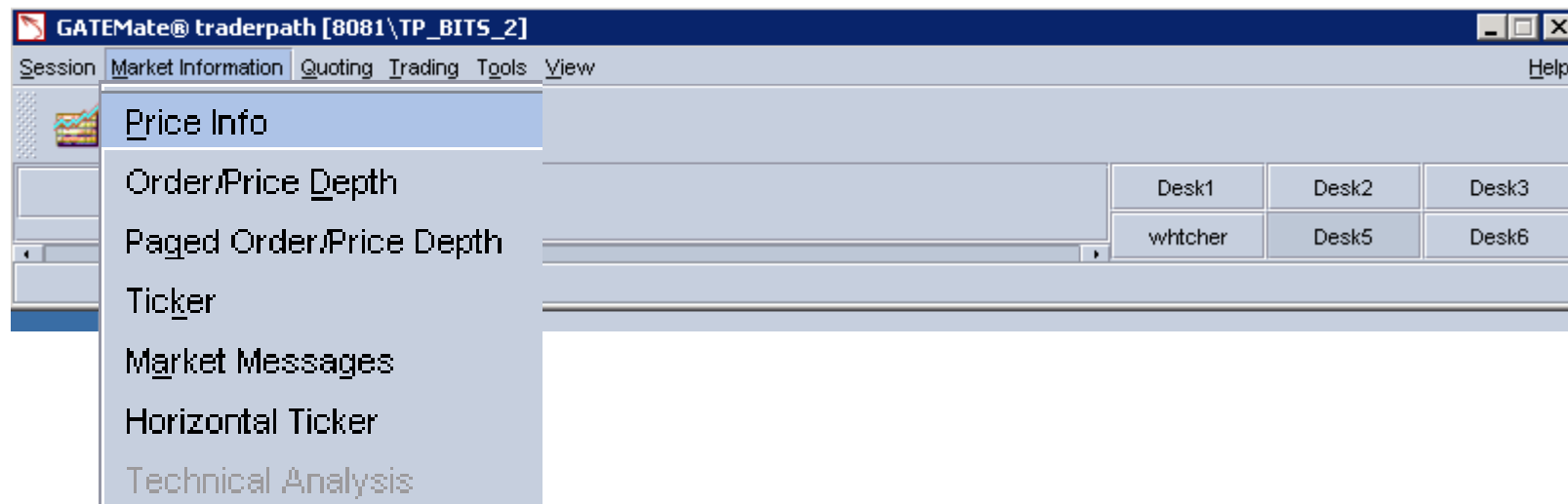
# *Connectivity*

- BaneTele
- FNN
- Verizon
- VPN client

# Login



# *Market information / price information*



# Price information / dictionary

Dictionary

ISIN
  Description
  Symbol
  Visible Code

ISIN	Symbol	Description	SubMarket	Category	Currency	MinSize	ExpireDate	Strike	SizeMultiplier	PriceMultiplier	Class
GB0H...	E010AZ	AZA9I9 ...	EDX	Call Optio...	GBP	1	2009/09/18	9,0000	1	1	1 AZA
US0N...	E010DA	DANSKE96...	EDX	Call Optio...	NOK	1	2009/07/17	58,0000	1	1	1 DANS
US1K...	E010ER	ERICB9L61 ...	EDX	Call Optio...	NOK	1	2009/12/18	61,0000	1	1	1 ERICE
US3H...	E010MN	MNOD9I34 ...	EDX	Call Optio...	NOK	1	2009/09/18	34,0000	1	1	1 MNOD
US5L...	E010OZ	O6Z9I9 ...	EDX	Call Optio...	NOK	1	2009/09/18	9,0000	1	1	1 OGZ
US6K...	E010RI	RIOB9J1260...	EDX	Call Optio...	NOK	1	2009/10/16	1.260,...	1	1	1 RIOB
US7O...	E010SE	SEBA9J11 ...	EDX	Call Optio...	NOK	1	2009/10/16	11,0000	1	1	1 SEBA
SE0U...	E010SW	SWEBA9G4...	EDX	Call Optio...	SEK	1	2009/07/17	42,0000	1	1	1 SWEE
US8S...	E010VW	VWS9K13 ...	EDX	Call Optio...	NOK	1	2009/11/20	13,0000	1	1	1 VWS
NO26...	E010ZB	ZB9I2 ...	EDX	Call Optio...	GBP	1	2009/09/18	2,0000	1	1	1 ZB
IS5L...	E020KA	KAUP9I6 ...	EDX	Call Optio...	GBP	1	2009/09/18	6,0000	1	1	1 KAUP
US0Y...	E020MA	MAERSK9H...	EDX	Call Optio...	NOK	1	2009/08/21	11,0000	1	1	1 MAEF

Rows: 2634

Ok Apply Cancel

# Order/Price depth / enter order

Configuration Orders Tool

E010ER [LSEG\_DER | EDX]

Price Depth

BidWkSize	BidSize	Price	AskSize	AskWkSize
		B 10,7400	S 110	110,0
		B 10,6700	S 110	110,0
		B 10,5700	S 10	10,0
		B 10,4300	S 10	10,0
10,0	10	B 10,0000	S	
10,0	10	B 9,9600	S	
110,0	110	B 9,9300	S	
110,0	110	B 9,8600	S	

Orders

110 @ 9,86 Day  
Size (1 1)

Price (0,0001 0,01) 9,86

110

1 5 10

100 Clear 500

Life Time

Day

Day

Good Till Cancel

Immediate or Cancel

Good Till Date

Buy

Sell

Auto CO

TO >>

Info

Last 10 @ 10,24 2009/07/17 15:35:07.000

Ref. Price

OpngPr

TheorOpngPr

ValidOpngPr

TotOpngExeSize

ImbalanceAtOpng

Low 10,2400

High 10,2400

Phase Continuous trading

%Diff

Suspended No

Reactivation Time

CumSize 10

Avg Price

Net

MatchedPL

UnmatchedPL

P&L

Last 5 Trades

Price	Size	Time
		15:35:07.0...

MinSize

Disp Size

Trader ID 0912EB1

ClearingInstr TEST

Clearing Mode

Clearing Destination

Hedg/Spec Speculator

Portfolio

Position Open

Open Close

Ord Ref

Active

AutoRemoval

Notes

# Price information / quote request

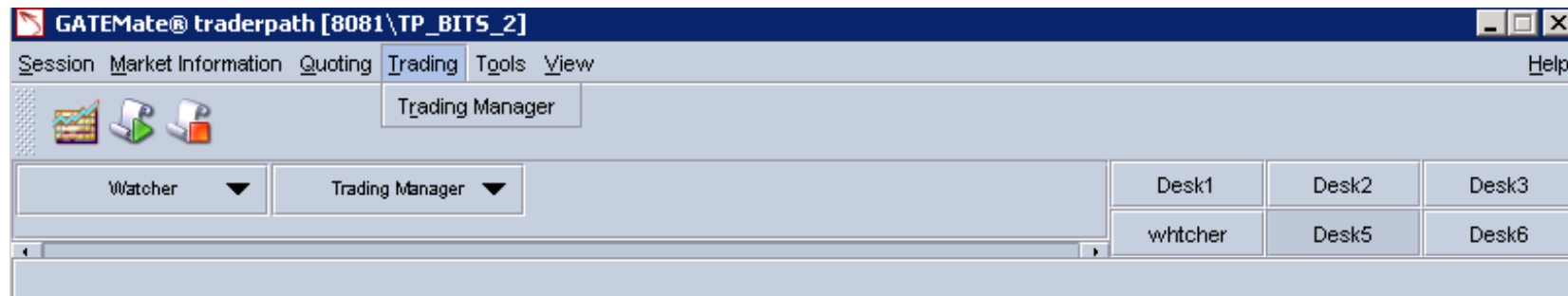
The screenshot displays a trading application window titled "Price Info [8081\TP\_BITS\_2]:12". The interface includes several panels:

- Configuration Orders:** A top panel with a search bar and a "Cumulative" summary table.
- Orders:** A panel on the left with input fields for "Size" and "Price", and buttons for "1", "5", "10", "100", "Clear", and "500". It also includes "Life Time", "Account Type", and "Agent Account" dropdowns.
- Market Messages [8081\TP\_BITS\_2]:5:** A central window showing a configuration table and a list of messages. The message text is "LSEG\_... Quote Reques... O710PG, Bid/Ask, quantity 4".
- Market Messages [8081\TP\_BITS\_2]:5 (Detail):** A bottom window titled "LSEG\_DER | ODX-0710PG Quote Request [8081\TP\_BITS\_2]" showing a "Size" of 100 and a "Send" button.
- Table:** A table at the bottom listing market instruments with columns for ISIN, Symbol, Description, Market, MarketInstrumentType, and Cat.

ISIN	Symbol	Description	Market	MarketInstrumentType	Cat
US1...	E010ER	ERIC9901...	LSEG_...		Call
NO9J...	O520PG	PGS9U19...	LSEG_...		Call
NO9J...	O620PG	PGS9U21...	LSEG_...		Call
NO6...	O070DN	DNBNOR1M...	LSEG_...		Call
GB0...	E010AZ	AZA919...	LSEG_...		Call
US0...	E010DA	DANSKE9G...	LSEG_...		Call
US3...	E010MN	MNOD9134...	LSEG_...		Call Optio...
US51...	E010OZ	OGZ919...	LSEG_...		Call Optio...
US6...	E010RI	RIOB9J126...	LSEG_...		Call Optio...
US7...	E010SE	SEBA9J11...	LSEG_...		Call Optio...

Visible rows: 2634

# Trading / trading manager



# Trading / trading manager

Trading [LSEG\_DER | EDX, LSEG\_DER | ODX] [8081\TP\_BITS\_2]:8

Configuration Orders Trades Positions

Orders - Filter OFF - TOTAL ORDERS: 17 - VISIBLE ORDERS: 17

FSt	ISIN	Symbol	Desc	Mkt	Timer	SDate	EDate	FRate	Date	MktDate	CreationDate	T1
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:44:45.172			
●	NO911ULVTTV4	O710PG	PGS9W26	LSEG_DER   ODX					2009/07/17 15:28:30.688	20090717 16:28:30.000	2009/07/17 16:28:30	
●	NO911ULVTTV4	O710PG	PGS9W26	LSEG_DER   ODX					2009/07/17 15:28:30.703	20090717 16:28:30.000	2009/07/17 16:28:27	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:09:26.276			
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:36:03	2009/07/17 15:36:03	2009/07/17 15:36:03	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:35:56	2009/07/17 15:35:56	2009/07/17 15:35:56	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:35:47	2009/07/17 15:35:47	2009/07/17 15:35:47	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:35:37	2009/07/17 15:35:37	2009/07/17 15:35:37	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:35:31	2009/07/17 15:35:31	2009/07/17 15:35:31	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:35:25	2009/07/17 15:35:25	2009/07/17 15:35:25	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:35:07.000	2009/07/17 15:35:07	2009/07/17 15:35:07	
●	US1KT4B128W2	E010ER	ERICB9L61	LSEG_DER   EDX					2009/07/17 15:34:48	2009/07/17 15:34:48	2009/07/17 15:34:48	

Trades - Filter OFF - TOTAL TRADES: 4 - VISIBLE TRADES: 4

FSt	ISIN	Symbol	InstrCode	Desc	Mkt	SDate	EDate	TransTime	Member	User	Portfolio
●	NO911ULVTTV4	O710PG	O710PG	PGS9W26	LSEG_DER   ODX			16:28:30	8081	TP_BITS_2	DEFPORTFOLI
●	NO911ULVTTV4	O710PG	O710PG	PGS9W26	LSEG_DER   ODX			16:28:30	8081	TP_BITS_2	DEFPORTFOLI
●	US1KT4B128W2	E010ER	E010ER	ERICB9L61	LSEG_DER   EDX			15:35:07	8081	TP_BITS_2	DEFPORTFOLI
●	US1KT4B128W2	E010ER	E010ER	ERICB9L61	LSEG_DER   EDX			15:35:07	8081	TP_BITS_2	DEFPORTFOLI

PK by Portfolio - PK by Customer - PK by Market - PK by User - PK by Instrument

Tree	Net Size	Matched P&L	Unmatched P&L	P&L	Bid Trades	Bid Size	Avg BidPrice	Avg AskPrice	Ask Size	Ask Trades	Cum BidAmt	Cum AskAmt	Cash Bal
DEF					2	20	10,620	10,620	20	2	212,400	212,400	

Context Menu:

- Modify
- Remove
- Activate
- Deactivate
- Accept
- Reject
- Duplicate
- Show History
- Order/Price Depth
- Outbound Hand-Over
- Inbound Hand-Over
- Forced Hand-Over

# Quoting

GATEMate@ traderpath [8081\TP\_BITS\_2]

Session Market Information **Quoting** Trading Tools View Help

Auto Quoter  
Start All F3  
Stop All F4

Watcher Quoting [8081\TP...]

Desk1 Desk2 Desk3  
whtcher Desk5 Desk6

Quoting [8081\TP\_BITS\_2]

Configuration Contribution

Quotes. Total: 1 - Visible: 1

Isin	InstrumentCode	Symbol	Description	Market	Bid Px	Qo Ask Px	Qo Ask Size	Qed Bid Size	Qed Bid Px	Qed Ask Px	Qed Ask Size	Strategies
US70QR99X5V2	E010SE	E010SE	SEBA9J11	LSEG ...	0,5	0,9	10					

## *Key dates / Pricing*

- When available
  - BTS will be available for the members and ISV's in week 38
- Pricing
  - The price will be at about the same price level as CLICK Trade
    - CLICK Trade today costs SEK 5500 per month for the first terminal and if you have more than one, the others costs SEK 5000 per month

# *Product offering and member rules*

*Linn Furuvald, Product Manager Oslo Børs*

2 September 2009

## *Product offering from 16 November 2009*

- OB will offer the same products as today
- In addition: Stock futures
  - daily cash settlement and physical delivery of underlying stock

# *Derivatives Rules*

- Small changes
  - Hearing not necessary
- Updated rules and membership agreements will be sent out in the middle of October
  - Membership agreements to be signed

# *Contact Details*

## **Oslo Børs Technical Support**

technicalsupport@oslobors.no

+47 2234 1818

## **SOLA Support**

[solasupport@oslobors.no](mailto:solasupport@oslobors.no)

## **MPS (Market Place Services) Desk**

Support for any business and/or market questions

+47 2234 1850

Website: [www.oslobors.no](http://www.oslobors.no)

